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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/780,745	02/19/2004	Peter Jaenecke	Q79863	1795

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EXAMINER	
TIMORY, KABIR A	
ART UNIT	**PAPER NUMBER**
2609	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/26/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/780,745	JAENECKE ET AL.	
	Examiner	Art Unit	
	Kabir A. Timory	2112	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 February 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 February 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *2/19/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. Figure 1, 2, and 3 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claims 1 - 10 are objected to because of the following informalities:

(1) In claim 1, line 8, "the number of soft-clippings" should be changed to **"a number of soft-clippings"**.

(2) In claim 1, line 9, "the positions" should be changed to **"positions"**.

(3) In claim 1, line 10, "the positions" should be changed to **"positions"**.

(4) In claim 1, line 10, "the respective scalings" should be changed to **"respective scalings"**.

(5) In claim 1, line 11, "the amplitude" should be changed to **"an amplitude"**.

(6) In claim 6, line 7, "the number of soft-clippings" should be changed to **"a number of soft-clippings"**.

(7) In claim 6, line 8, "the positions" should be changed to **"positions"**.

(8) In claim 6, line 9, "the respective scalings" should be changed to **"respective scalings"**.

(9) In claim 6, line 10 and 11, "the amplitude" should be changed to **"an amplitude"**.

(10) In claim 7, line 8, "the number of soft-clippings" should be changed to **"a number of soft-clippings"**.

(11) In claim 7, line 9, "the positions" should be changed to **"positions"**.

(12) In claim 7, line 10, "the respective scalings" should be changed to **"respective scalings"**.

(13) In claim 7, line 11, "amplitude" should be changed to **"an amplitude"**.

(14) In claim 8, line 9, "the number of soft-clippings" should be changed to **"a number of soft-clippings"**.

(15) In claim 8, line 10, "the positions" should be changed to **"positions"**.

(16) In claim 8, line 11, "the respective scalings" should be changed to **"respective scalings"**.

(17) In claim 8, line 12, "the amplitude" should be changed to **"an amplitude"**.

(18) In claim 9, line 11, "the number of soft-clippings" should be changed to **" number of soft-clippings"**.

(19) In claim 9, line 12, "the positions" should be changed to **"positions"**.

(20) In claim 9, line 14, "the respective scalings" should be changed to **"respective scalings"**.

(21) In claim 9, line 15, "the amplitude" should be changed to **"an amplitude"**.

(22) In claim 10, line 15, "the reduction" should be changed to **"a reduction"**.

(23) In claim 10, line 15, , "the number of soft-clippings" should be changed to **"a number of soft-clippings"**.

(24) In claim 4, line 2, the spelling of "minimising" should be changed to **" minimizing"**.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 2 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1, line 1, recite the limitation "**parameterising**". There is no clear definition and explicit description for limitation in the claims. It is unclear if this limitation of the claim intended to refer "giving a value to the peak signal" or "it is the threshold level". However, the term "**parameterising**" differs from "giving a value to the peak signal or threshold level". However, the examiner suggests for clarification the term and elaborating on the definition of the term "**parameterising**".

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1, 2, 3 5, and 7 are rejected under 35 U.S.C. 102(e) as being anticipated by Morris et al. (US Pub Number 2004/0203430).

Regarding claim 1:

Morris et al. discloses a method of reducing a peak-to-average power ratio of a signal to be transmitted (Paragraph 0001, lines 1-3), the method comprising the steps of:

- detecting a portion (figure 5b, 542) of the signal being above a clipping threshold level (figure 4, Paragraph 0007, lines 1-4),

- decomposing the portion of the signal into a number of functions (decomposing the portion of the signal is interpreted to be the Gaussian, Hanning, Hamming, Triangle, etc functions) (figure 4, Paragraph 0036, lines 10-13),

- the number of functions being proportional to a duration of the portion of the signal (figure 4),

- performing a number of soft-clippings on the signal by means of a reference function (Paragraph 0005, lines 5-9),

- a positions of the soft-clippings being given by a positions of the functions and a respective scalings (figure 5b, 544) of the reference function being determined by an amplitudes of the functions (the magnitude of a signal is interpreted to be the amplitude of the signal) (Paragraph 7, lines 1-6).

Regarding claim 2:

The method of claim 1, further comprising:

- parameterising the functions by determining an amplitude value and a position value for each function (parameterising is interpreted to be the measuring an input signal, detecting a signal peak with a magnitude exceeding a specified threshold) (Paragraph 0007, lines 1-6).

Regarding claim 3:

The method of claim 1, the functions being symmetric (figure 4).

Regarding claim 5:

The method of claim 1, whereby the soft-clipping (Paragraph 0005, lines 5-7) is performed by using the positions of the functions as peak positions for subtracting of the reference function (figure 4, 425, Paragraph 0035, lines 1-9).

Regarding claim 7:

Morris et al. discloses an electronic circuit for reducing a peak-to-average power ratio of a signal to be transmitted (figure 5, 500, abstract), the electronic circuit comprising:

- means for detecting (figure 5, 542) a portion of the signal being above a clipping threshold level (figure 4, Paragraph 0007, lines 1-4),

- means for decomposing of the portion of the signal into a number of functions (figure 5, 509), the number of functions being proportional to a duration of the portion of the signal (figure 4),

- means for performing a number of soft-clippings (figure 5, 507) on the signal by means of a reference function, positions of the soft-clippings being given by the positions of the functions and respective scalings of the reference function being determined by an amplitudes of the functions (the magnitude of a signal is interpreted to be the amplitude of the signal) (Paragraph 7, lines 1-6).

Regarding claim 8:

An end user telecommunication device for sending of a signal, the end user telecommunication device comprising signal processing means for reducing a peak-to average power ratio of the signal by the steps of: (telecommunication device and end user telecommunication device are interpreted to be parts of a communication network such as wireless cellular network. A wireless cellular network consists of a base station, transmitters and receivers, and mobile stations such as mobile phones) (Paragraph 0023, lines 1-3)

- detecting a portion (figure 5b, 542) of the signal being above a equipping threshold level (figure 4, Paragraph 0007, lines 1-4),

- decomposing the portion of the signal into a number of functions, the number of functions being proportional to a duration of the portion of the signal (decomposing the portion of the signal is interpreted to be the Gaussian, Hanning, Hamming, Triangle, etc functions) (figure 4, Paragraph 0036, lines 10-13),

- performing a number of soft-clippings on the signal by means of a reference function (column 0005, lines 5-9), positions of the soft-clippings being given by the positions of the functions and respective scalings of a reference function being determined by an amplitudes of the functions (the magnitude of a signal is interpreted to be the amplitude of the signal) (Paragraph 7, lines 1-6).

Regarding claim 9:

A transmitter (transmitter is interpreted to be parts of a communication network such as wireless cellular network. A wireless cellular network consists of a base station, transmitters and receivers, and mobile stations such as mobile phones) (Paragraph 0023, lines 1-3)

comprising:

- means for multi-carrier synthesis to provide a multi-carrier multiplexed signal to be transmitted (OFDM "Orthogonal Frequency Division Multiplexing" is interpreted to be a multi-carrier synthesis) (Paragraph 0023, lines 21-26),

- means for reducing a peak-to-average power ratio of the signal by the steps of (abstract):

a) detecting a portion (figure 5b, 542) of the signal being above a clipping threshold level (figure 4, Paragraph 0007, lines 1-4),

b) decomposing the portion of the signal into a number of functions, the number of functions being proportional to a duration of the portion of the signal (figure 4, Paragraph 0036, lines 10-13),

c) performing a number of soft-clippings on the signal by means of a reference function (Paragraph 0005, lines 5-9), positions of the soft-clippings being given by positions of the functions and the respective scalings of the reference function being determined by an amplitudes of the functions (the magnitude of a signal is interpreted to be the amplitude of the signal) (Paragraph 7, lines 1-6).

Regarding claim 10:

A telecommunication system having at least one base station (base station is interpreted to be parts of a communication network such as wireless cellular network. A wireless cellular network consists of a base station, transmitters and receivers, and mobile stations such as mobile phones) (Paragraph 0023, lines 1-3)
comprising
- an electronic circuit for reducing a peak-to-average power ratio of a signal to be transmitted (abstract, lines 5-9),
- the electronic circuit being adapted to perform a reduction by detecting a portion of the signal being above a clipping threshold level (figure 4, c Paragraph 0007, lines 1-4), decomposing the portion of the signal into a number of functions, the number of functions being proportional to a duration of the portion of the signal (figure 4),
and performing a number of soft-clippings on the signal (Paragraph 0005, lines 5-9).

7. Claim 6 is rejected under 35 U.S.C. 102(e) as being anticipated by Lipka et al. (US Pub. Number 2006/0029158).

Regarding claim 6:

A computer program product, in particular digital storage medium, for reducing a peak-to-average power ratio of a signal to be transmitted (Paragraph 0023, lines 1-7), comprising program means for performing the steps of:

- decomposing of a portion of the signal being above a clipping threshold level into a number of functions, the number of functions being proportional to a duration of the portion of the signal (Paragraph 0016, lines 1-11) ,

- performing a number of soft-clippings on the portion of the signal by means of a reference function (Paragraph 0051, lines 1-4), the positions of the soft-clippings being given by the positions of the functions and the respective scalings of the reference function being determined by the amplitudes of the functions (Paragraph 0056, lines 13-16).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morris et al. (US Pub Number 2004/0203430) in view of Lipka et al. (US Pub. Number 2006/0029158).

Regarding claim 4:

Morris et al. discloses all of the subject matter as described above in claim 1 except for specifically teaching the step of decomposing being performed by minimizing of

$$[P - \sum_{i=1}^{N} f(x_i, A_i)]^2$$

or

$$| P - \sum_{i=1}^{N} f(x_i, A_i) |$$

However, Lipka et al., in the same field of endeavor, teaches an analogous approach in deriving a similar equation to compute the peak power reduction (paragraph 0059 and 0060) as shown below:

$$s(t_p) = \sum_{k=0}^{k_{max}} c[k] \cdot h_c(t_p - kT_c)$$

and

$$\tilde{c}[k] = c_m[k] - \frac{h_c(t_p - kT_c)}{\sum_{k=0}^{k_{max}} h_c^2(t_p - kT_c)} \cdot \frac{|s_{MC}(t_p)| - S_p}{|s_{MC}(t_p)|} \cdot a_m \cdot s_m(t_p)$$

Where the first equation shows the peak reduction strategy for a single carrier and the second equation shows the strategy for multiple carriers. As shown in the above equations Lipka et al. is using these formulas for subtracting the peak power of a single and multiple carrier signal. One of ordinary skill in the art would have clearly recognized that these two equations show a similar method of computing the peak power of a signal as the equation in claim 4. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to use the similar and related formula as

taught by Lipka et al. to compute peak power reduction. In order to detect amplitude peaks and preventing any amplitude peaks from appearing in the processed output signal, the above formula can be used.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kabir A. Timory whose telephone number is (571) 270-1674. The examiner can normally be reached on Mon - Thu 6:30AM - 4:00PM & Fri 6:30AM - 3:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on (571) 272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kabir A. Timory
January 19, 2007

SHUWANG LIU
SUPERVISORY PATENT EXAMINER